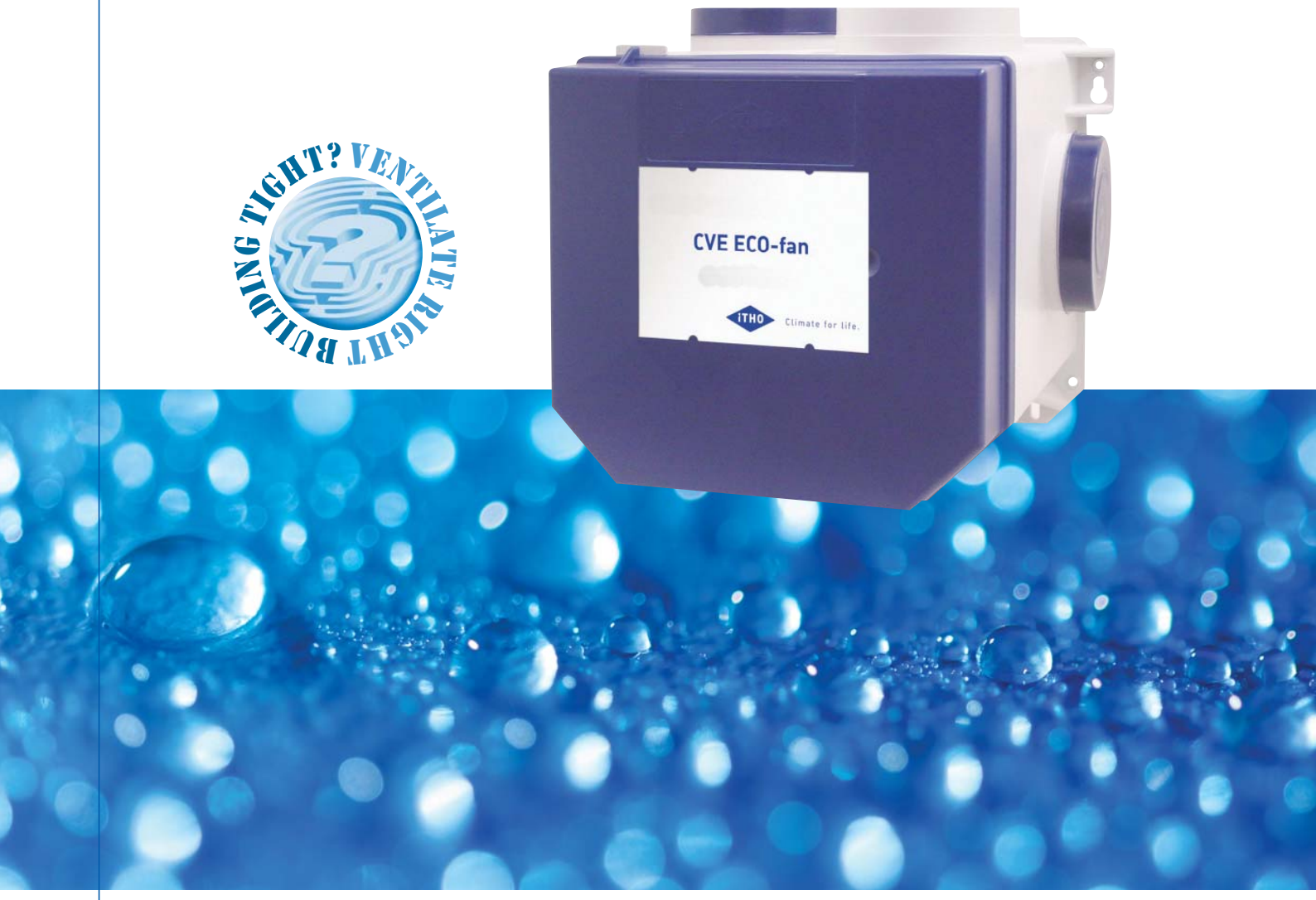
LivingBlue

CVE ECO 2

System 3

Continuous Mechanical Extract

Appendix Q Eligible



BUILDING TIGHT? VENTILATE RIGHT

itho
Climate for life

A Climate for Life

Itho was founded in 1919. In the years since, the company has established itself as the market leader in indoor climate systems. Complementing its unrivalled ventilation systems, Itho also designs and manufactures high efficiency boilers, solar hot water systems, ground source heat pumps and other energy-saving systems at its headquarters in the Netherlands.
Itho UK Ltd, based in Burton on Trent, is part of the Itho Daalderop Group and was the company's first subsidiary outside of the Netherlands.

Reduced energy consumption, yet improved comfort. The healthiest possible interior atmosphere, yet lower running costs. These are the seemingly contradictory goals that we've been achieving at Itho for more than 90 years, proving that we can enjoy a superior living environment within the home and protect our natural environment. We call this a Climate for Life. This means that the homes you build can provide fresh, filtered air, cost less to ventilate and emit fewer emissions.

About your CVE ECO 2

Installation and user manual

Your CVE ECO 2 installation and user manual will be supplied with the unit. Further copies are available from Itho UK Ltd or online at www.itho.co.uk.

Location

The CVE ECO 2 can be installed in closed rooms, lofts, storage rooms or airing cupboards in all types of new dwellings, light commercial premises and refurbishment projects.

Ducting

Ducting within the dwelling should be either 204mm x 60mm modular plastic or 125mm diameter rigid plastic ducting. All ducting joints need to be made air tight with tape and/or non-setting mastic. This will ensure that the system achieves its designed efficiencies.

Commissioning

Once installed, the system will need to be set up and commissioned to comply with the Domestic Ventilation Compliance Guide and the SAP Appendix Q Continuous Mechanical Extract Ventilation Installation Guide and Check List.

CVE ECO 2 variations available

CODE	MODEL	Connection to the interior	Connection to the outside air	Capacity	Pressure
110-0181	CVE ECO 2 5 core cable + RFT	4 x Ø 125 mm	1 x Ø 125 mm	325 m³/h	150 Pa
110-0179	CVE ECO 2 HP 5 core cable + RFT	4 x Ø 125 mm	1 x Ø 125 mm	415 m³/h	150 Pa

Construction

The CVE ECO 2 unit is manufactured in recyclable polypropylene and incorporates a pyramid shaped silencer to reduce noise and direct internal airflow for maximum performance. The silencer is made from polyurethane/ polyester acoustic foam and is flame retardant to MVSS 302 and UL94 HF1 standards.
The housing and the fan scroll form a single assembly. Mounting eyes and cable clamps are built-in. The unit's front cover provides further sound proofing.

Motor and chassis

The unit has an energy efficient direct current motor and an impeller with backward curved blades. This minimises the build-up of dust and contaminants, enabling the CVE ECO 2 to deliver maximum performance for extended periods of time.

The motor/fan assembly, electrical components and the power cable are fitted to the CVE ECO 2 motor chassis.

Setting the CVE ECO 2

The CVE ECO 2 has two potentiometers which allow the low and high settings to be adjusted for maximum energy efficiency. The unit automatically calculates the medium setting between the low and high settings values.

Adjusting settings
The right to make changes is reserved

Cable guides

Two clips are fitted to the underside of the unit to guide the cable.

Electrical connection

The unit is delivered with 1 metre of 5 core cable attached and must be connected to a 230V 50Hz mains power supply.

Control

The CVE ECO 2 can be controlled by a three-way wired switch or by one or more wireless (RFT) three-position controllers with timer function.

It is possible to use external environmental controllers with these extract ventilation units.

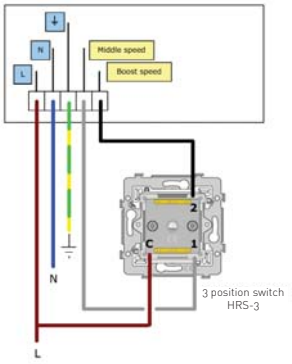
These controllers are optional extras and not included with the unit.

Three position switch model

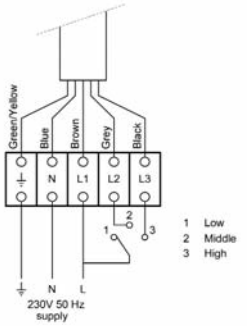
A three-position switch (without an "off" position) can be simply

connected using three connecting wires directly to the wall socket (see wiring diagram).

Wiring Diagrams for Hard Wired Version (5 core cable)



With an HRS-3 Speed Controller



With a 3 way switch by others

Wireless (RFT) three-position switch with timer function

Do not place the RFT control switch on a metal surface.

Adding wireless controllers

The central unit can be controlled by several control switches from multiple rooms in the home.

Timer function

The RFT control switch also features a timer which can be used to select the high speed setting for 10, 20 or 30 minutes. After this period, the fan will revert back to low speed. Press the timer button once to activate high speed for 10 minutes, twice for 20 minutes and three times for 30 minutes. The timer function can be over-ridden at any time by pressing any of the three speed buttons.

RFT transmission information

- transmission range 100m in free air
- transmission indoors is possible through a maximum of two concrete floors
- pointing of transmitter towards the fan is not necessary
- no external antenna
- frequency 868 MHz, no licence required

The CVE ECO 2 and apartment blocks

When connecting the CVE ECO 2 to a common riser duct to ventilate apartments in multi-storey blocks, air from the central exhaust duct must not flow back into the dwelling.

The CVE ECO 2 non-return flap model, CVH 125 will close the section between the extractor and the central chimney duct if, for example, the unit is turned off or unplugged from the wall.

For further information about non-return flaps, contact the Itho Technical Department.

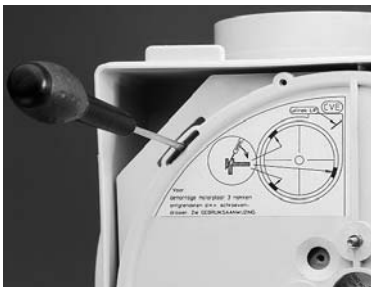
Removing the front cover

To remove the front cover of the CVE ECO 2, insert a screwdriver into the clasp at the top left of the unit and press open. The cover can now be pulled out by hand.

Removing the front cover

Removing the motor chassis with motor/fan assembly

To remove the motor chassis insert a flat blade screwdriver into each of its three slots, then pull towards the chassis to release the clamps within. The chassis, including the motor and fan, can now be released using a lifting strip at the top right of the chassis.



Removing the motor chassis

Handbooks

The Itho CVE ECO 2 User's Handbook, supplied with your unit contains:

- information about ventilation in general, current regulations and maintenance of your extractor unit
- reports of inspection measurements and values measured on delivery
- your guarantee certificate.

Maintenance

The unit must be accessible to allow maintenance and inspection at all times.
Due to its design and use of backward curved impellors the CVE ECO 2 accumulates significantly less dust and grime than standard units and will only need cleaning once every four to five years of normal use.

Guarantee

The Itho CVE ECO 2 is covered by a written three-year guarantee commencing on the date of installation. The guarantee provides for the replacement of the motor/fan assembly free of charge during the guarantee period. The battery of the RF transmitter does not fall under the guarantee. See the guarantee conditions included in every extractor unit.

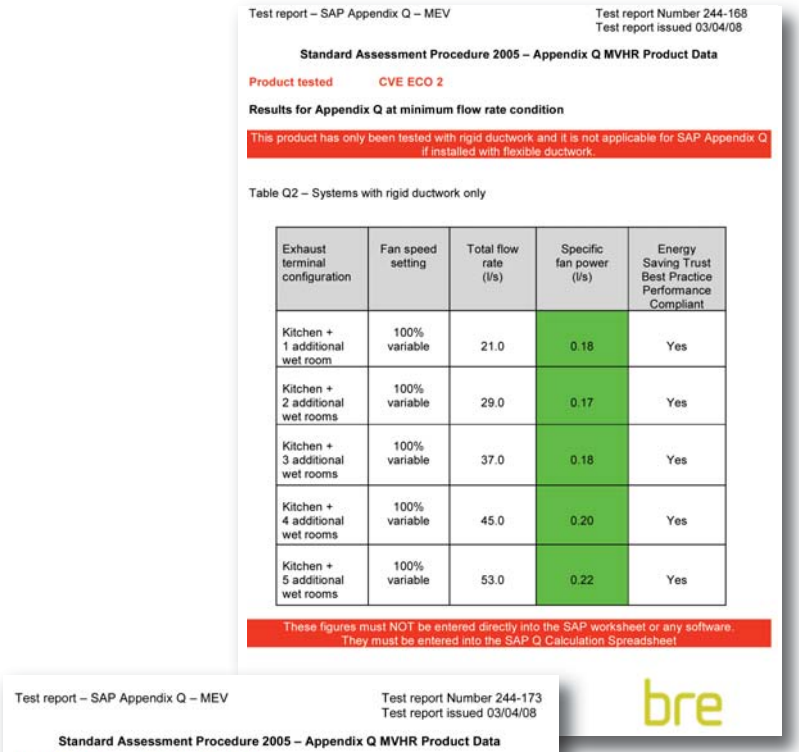
SAP Appendix Q

The Standard Assessment Procedure (SAP) Appendix Q website, www.sapappendixq.org.uk, is a UK-based Government led initiative for demonstrating compliance with Building Regulations within Part L (England and Wales), Section 6 (Scotland) and Part F (Northern Ireland). See also the Dwelling Energy Assessment Procedure (DEAP) for the Republic of Ireland.

SAP Appendix Q is a database of energy efficient technologies which have been assessed for performance. The results can be input into a SAP assessment submission.

BRE independent test results for the CVE ECO 2

The Energy Saving Trust's 'Demonstrating Compliance - Best Practice', states that MEV units must have a specific fan power (SFP) of 0.6 W/l/s or less. As this table shows, the CVE ECO 2 and the CVE ECO 2 HP far exceeds this requirement.



Test report – SAP Appendix Q – MEV

Test report Number 244-168
Test report issued 03/04/08

Standard Assessment Procedure 2005 – Appendix Q MVHR Product Data

Product tested CVE ECO 2

Results for Appendix Q at minimum flow rate condition

This product has only been tested with rigid ductwork and it is not applicable for SAP Appendix Q if installed with flexible ductwork.

Table Q2 – Systems with rigid ductwork only

Exhaust terminal configuration	Fan speed setting	Total flow rate (l/s)	Specific fan power (l/s)	Energy Saving Trust Best Practice Performance Compliant
Kitchen + 1 additional wet room	100% variable	21.0	0.18	Yes
Kitchen + 2 additional wet rooms	100% variable	29.0	0.17	Yes
Kitchen + 3 additional wet rooms	100% variable	37.0	0.18	Yes
Kitchen + 4 additional wet rooms	100% variable	45.0	0.20	Yes
Kitchen + 5 additional wet rooms	100% variable	53.0	0.22	Yes

These figures must NOT be entered directly into the SAP worksheet or any software. They must be entered into the SAP Q Calculation Spreadsheet

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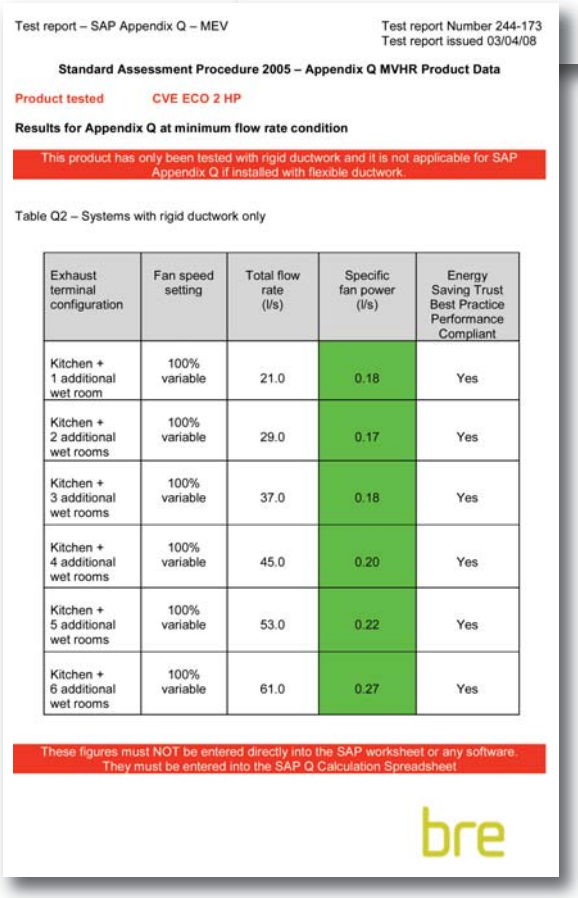


Test report – SAP Appendix Q – MEV

Test report Number 244-173
Test report issued 03/04/08

Standard Assessment Procedure 2005 – Appendix Q MVHR Product Data

Product tested CVE ECO 2 HP

Results for Appendix Q at minimum flow rate condition

This product has only been tested with rigid ductwork and it is not applicable for SAP Appendix Q if installed with flexible ductwork.

Table Q2 – Systems with rigid ductwork only

Exhaust terminal configuration	Fan speed setting	Total flow rate (l/s)	Specific fan power (l/s)	Energy Saving Trust Best Practice Performance Compliant
Kitchen + 1 additional wet room	100% variable	21.0	0.18	Yes
Kitchen + 2 additional wet rooms	100% variable	29.0	0.17	Yes
Kitchen + 3 additional wet rooms	100% variable	37.0	0.18	Yes
Kitchen + 4 additional wet rooms	100% variable	45.0	0.20	Yes
Kitchen + 5 additional wet rooms	100% variable	53.0	0.22	Yes
Kitchen + 6 additional wet rooms	100% variable	61.0	0.27	Yes

These figures must NOT be entered directly into the SAP worksheet or any software. They must be entered into the SAP Q Calculation Spreadsheet

bre

Code for Sustainable Homes

A New National Standard

The Code for Sustainable Homes has been developed to improve sustainable building practice for new homes. It has been prepared by the Government who worked with the Building Research Establishment (BRE) and Construction Industry Research and Information Association (CIRIA), and consulted a Senior Steering Group consisting of Government, industry and NGO representatives.

Intended as a single national standard for designers and constructors of dwellings, the Code for Sustainable Homes is a means of driving continuous improvement, innovation and achievement in sustainable home building.

The Code complements the system of Energy Performance Certificates (EPCs) which was introduced in June 2007 under the Energy Performance of Buildings Directive (EPBD). On October 1st 2008 it became mandatory for landlords to order an EPC for property offered for rent with the requirement applying to property for sale becoming effective on 21st May 2010.

The Code measures the sustainability potential of a new dwelling and provides a rating for the 'whole home' as a package. It uses a 1 to 6 star rating system to indicate the energy saving credentials of a new home and sets minimum standards for energy and water use. In England, the Code replaces the EcoHomes scheme developed by the Building Research Establishment (BRE).

The Code also gives buyers better information about the environmental impact of their new home and its potential running costs. It will inform future developments of the Building Regulations regarding carbon emissions homes, and give developers increased regulatory certainty.

Code for Sustainable Homes – the route to 2016

The Code supports a target date - the year 2016 - for all new build homes in England and Wales to be zero carbon. With a series of recommended percentage reduction targets, initially for the public sector, and the private sector following suit shortly after, the suggested incremental targets are shown in the table below.

The 2010 editions of Part L of the Building Regulations (England and Wales) (Conservation of fuel and power) and Part F (Means of ventilation), which came into effect in October 2010 require that all homes be 25% more energy efficient than the previous regulations. It is expected that Levels 4, 5 & 6 will be incorporated into the national building regulations in England and Wales by 2016.

By choosing Itho, you're already there. The CVE ECO 2 – our continuous mechanical extract ventilation system (MEV) – is more than ready for the airtight home of 2016.

Code Levels for Mandatory Minimum Standards in CO2 Emissions

Code Level	Minimum percentage improvement in Dwelling Emission Rate Over Target Emission Rate
Level 1 (★)	10% (Compliance with Part L 2010 only is required)
Level 2 (★★)	0% (Compliance with Part L 2010 only is required)
Level 3 (★★★)	0% (Compliance with Part L 2010 only is required)
Level 4 (★★★★)	25%
Level 5 (★★★★★)	100%
Level 6 (★★★★★★)	Net Zero CO2 Emissions

Source: Code for Sustainable Homes: Technical Guide. November 2010, Page 12

Building Regulations

The October 2010 Edition of the UK Building Regulations Approved Document F1: Means of Ventilation (applicable in England and Wales) details four systems of ventilation to dwellings.

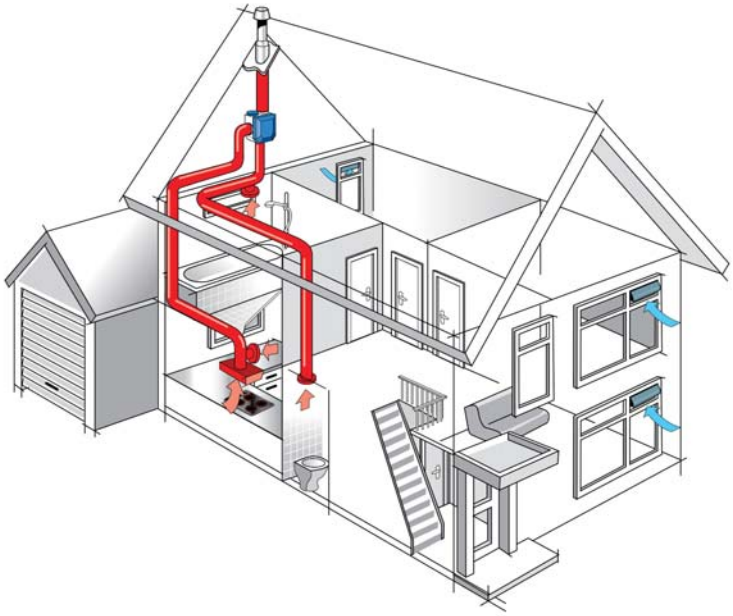
The requirements across the rest of the UK vary slightly: in Northern Ireland, the requirement to meet Code Level 3 in public sector housing became effective in April 2008. Scotland has issued a revised "The Building (Scotland) Amendment Regulations 2010" document which comes into force from 1st October 2010. The new energy standards for domestic buildings should deliver carbon dioxide savings of 30% more than the 2007 target. Plans for further changes in 2013 are targeting a saving of 75% more than the 2007 standards. The ambition is for total-life zero carbon buildings by 2030.

The Republic of Ireland has adopted the EU Directive on the Energy Performance of Buildings. This means that marketers of property for sale or rent have been obliged to prepare a Building Energy Rating (BER) certificate since January 2009. This applies to new and existing buildings.

System 3 - Continuous mechanical extract - requires a "minimum high rate" in each wet room to be achieved (kitchens 13 l/s, utilities and bathrooms 8 l/s, and sanitary accommodation 6 l/s). In employing this type of system background ventilators must be present in all habitable rooms whilst the air is extracted from all wet rooms.

Calculating ventilation rates

1. Determine the whole dwelling ventilation rate from Table 5.1b. The minimum low rate is calculated by taking the number of bedrooms in the dwelling and applying the l/s value from Table 5.1b. In addition, the rate should be no less than 0.3 l/s per m^2 of internal floor area (all storeys). For each additional occupant over and above the anticipated two for the first bedroom and one for each additional bedroom, a further 4 l/s must be added to the extract.



Note: No allowance is made for infiltration as the extract system lowers the pressure in the dwelling and all airflow through infiltration paths does not increase the overall ventilation rate.

2. Calculate the whole dwelling extract ventilation rate by adding the individual room rates for "minimum high rate" from Table 5.1a.

3. The required air flow rates are as follows:
The Maximum Extract Rate (boost) is the greater step of 1 and step 2 above. Note that the maximum individual room extract rates should be at least those given in Table 5.1a for minimum high rate.
The minimum whole dwelling extract ventilation rate should be at least the whole dwelling ventilation rate found in step 1 above.

Background Ventilation

Controllable background ventilators with a minimum 2500mm^2 equivalent area should be fitted in all habitable rooms. As an alternative, where the designed air permeability is leakier than (→)5m^3/(h.m^2) at 50 Pa background ventilators are not necessary. If further guidance is required please contact the Itho Technical Department for further advice.

Table 5.1 a

Room	Minimum Intermittent Extract Rate	Continuous Rate	
		Minimum high rate	Minimum low rate
Kitchen	30 l/s (adjacent to hob); or 60 l/s elsewhere	13 l/s	Total extract rate must be at least the whole building ventilation rate in table 5.1b
Utility Room	30 l/s	8 l/s	
Bathroom	15 l/s	8 l/s	
Sanitary Accommodation	6 l/s		

Table 5.1 b

	Number of bedrooms in dwelling				
	1	2	3	4	5
Whole Building Ventilation Rate (l/s)	13	17	21	25	29
	Minimum value in any dwelling of 0.3 l/s per m^2 floor area.				

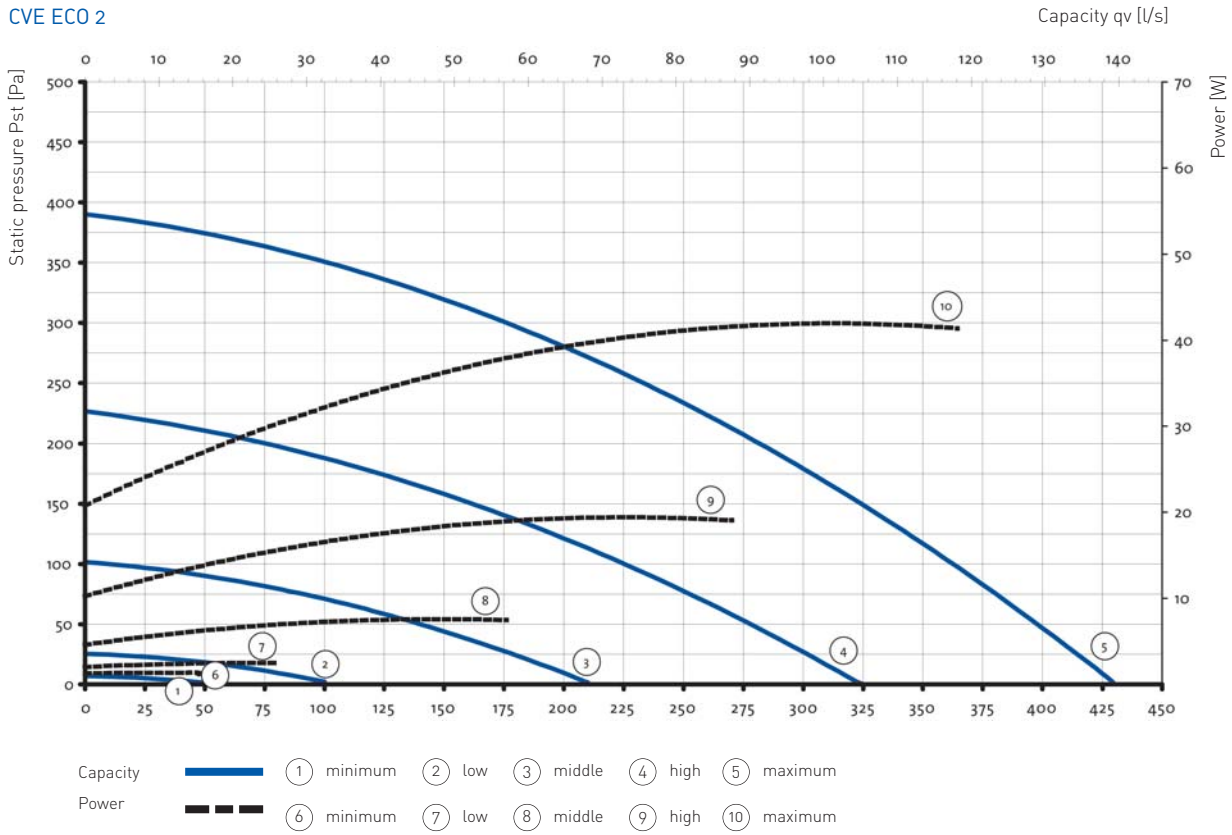
Technical Specifications

CVE ECO 2 (110-0181)

	Capacity [m³/h] Standard value	Range	Pressure [Pa]	Power [W]	Current [A] *
Setting 1 – Low	75	75-150	8	3.2	0.015
Setting 2 – Medium	150*	150	27	7.5	0.054
Setting 3 – High	225	175-325	100	22.0	0.165
Setting 3 – High	225	175-325	150	28.0	0.210
Setting 3 – Maximum	325	175-325	150	44	0.330

* Setting 2 is a calculated value that depends on the minimum and maximum capacities set.

CVE ECO 2



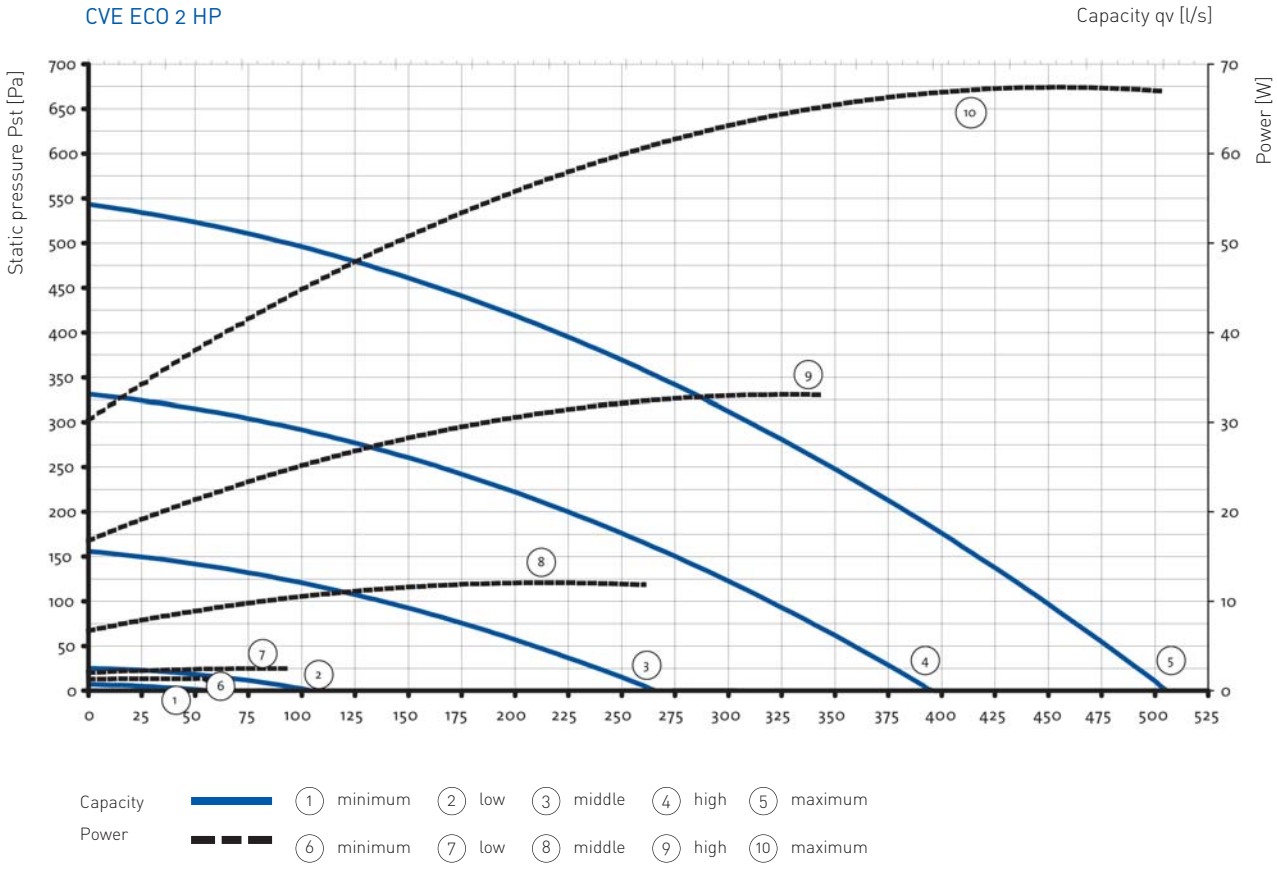
Noise levels Lw(A)	125 Hz	250 Hz dB(A)	500 Hz dB(A)	1000 Hz dB(A)	2000 Hz dB(A)	4000 Hz dB(A)	total dB(A)	dB(A)
Setting 1 radiated	75 m³/h / 11 Pa	47.2	35.8	31.7	25.7	20.5	18.3	34.9
Setting 2 radiated	135 m³/h / 45 Pa	50.1	42.5	37.9	31.2	25.3	23.5	39.9
Setting 3 radiated	225 m³/h / 100 Pa	51.4	49.1	48.5	40.8	37.5	29.1	48.3
Setting 3 max radiated	225 m³/h / 150 Pa	57.1	56.0	55.9	36.3	33.2	36.5	54.3
Setting 1 outlet	75 m³/h / 11 Pa	42.3	33.3	27.2	23.0	12.5	3.9	30.2
Setting 2 outlet	135 m³/h / 45 Pa	50.2	42.9	39.1	31.0	29.5	18.5	40.6
Setting 3 outlet	225 m³/h / 100 Pa	54.1	53.2	49.1	40.8	41.8	32.2	50.2
Setting 3 max outlet	225 m³/h / 150 Pa	59.1	59.3	55.2	47.3	48.1	39.2	56.4

The right to make changes is reserved

CVE ECO 2 HP (110-0179)

	Capacity [m³/h] Standard value	Capacity [m³/h] Range	Pressure [Pa]	Power [W]	Current [A] *
Setting 1 – Low	75	75-150	9	3.2	0.012
Setting 2 – Medium	150*	150	27	6.2	0.055
Setting 3 – High	225	175-415	100	19.2	0.157
Setting 3 – High	225	175-415	150	25.2	0.21
Setting 3 – Maximum	415	175-415	150	66.4	0.496

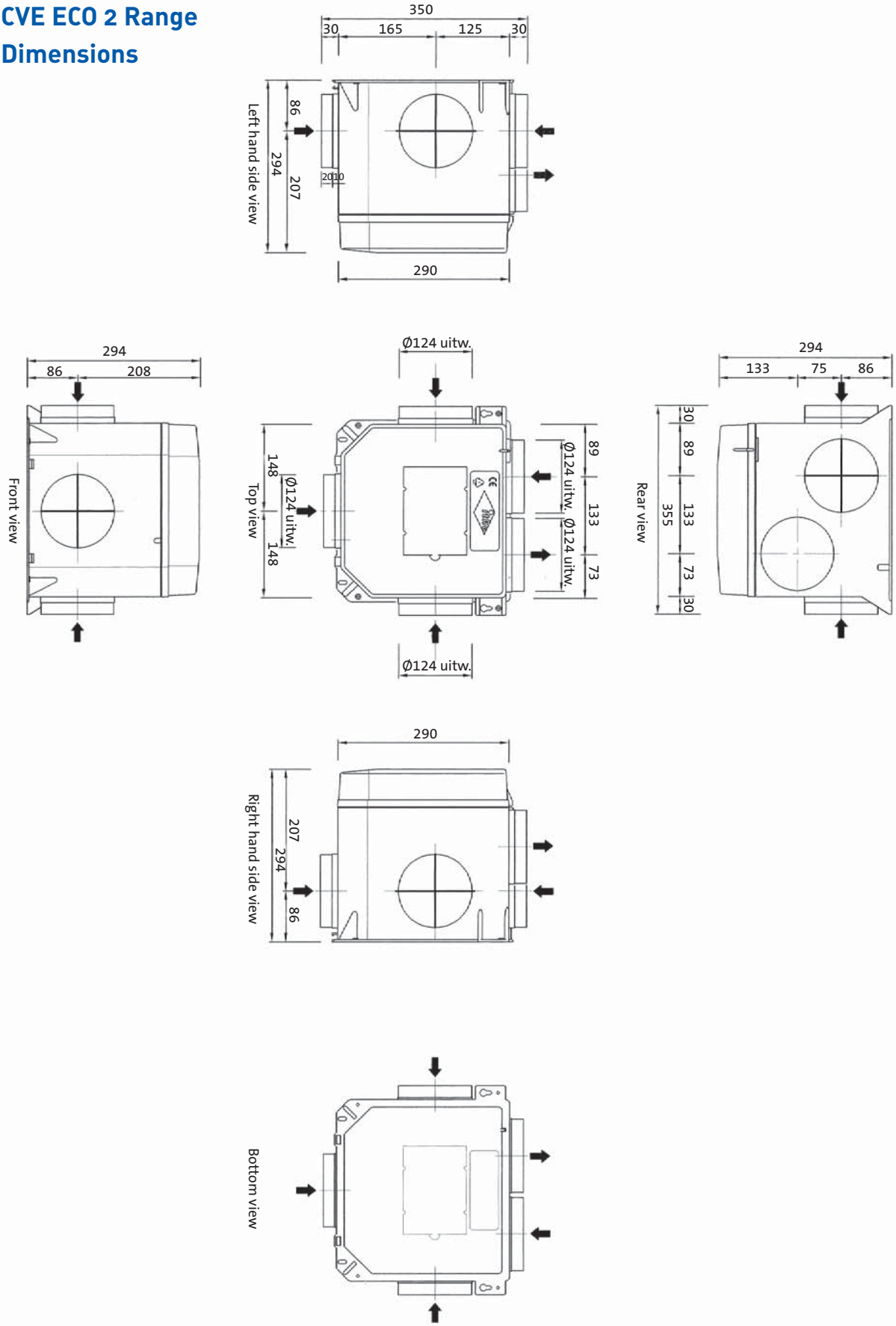
CVE ECO 2 HP



Noise levels Lw(A)		total dB(A)
Setting 1 radiated	75 m³/h / 11 Pa	35.1
Setting 2 radiated	135 m³/h / 45 Pa	40.2
Setting 3 radiated	225 m³/h / 100 Pa	47.9
Setting 3 max radiated	225 m³/h / 150 Pa	51.7
Setting 1 outlet	75 m³/h / 11 Pa	30.6
Setting 2 outlet	135 m³/h / 45 Pa	40.2
Setting 3 outlet	225 m³/h / 100 Pa	50.4
Setting 3 max outlet	225 m³/h / 150 Pa	54.3

The right to make changes is reserved

CVE ECO 2 Range
Dimensions



Notes

Climate

for life

Vision.
Our ultimate challenge is to create the climate neutral indoor environment that is also comfortable, healthy and cost efficient. At Itho, we are dedicated to solving the apparent contradiction between comfort and energy consumption. We believe that, by combining highly efficient equipment with reduced energy demand and sustainable methods of generating energy, this goal is achievable.

The development.
Within a decade, Itho has evolved from being a Dutch trading company into a self-developing manufacturer, supplying innovative products throughout Europe, partly through our own outlets.

The future.
Itho continues to innovate and plans to introduce new technologies in a growing number of European countries. And, as we grow, we look forward to increasing our network of partners and colleagues who share our vision, motives and enthusiasm.

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